



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/573,467

04/13/2007

Hiroya Kobayashi

46884-5465

9269

55694 7590 01/14/2008
DRINKER BIDDLE & REATH (DC)
1500 K STREET, N.W.
SUITE 1100
WASHINGTON, DC 20005-1209

EXAMINER

PATTON, PAUL E

ART UNIT

PAPER NUMBER

2822

MAIL DATE

DELIVERY MODE

01/14/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

114

Office Action Summary	Application No.	Applicant(s)	
	10/573,467	KOBAYASHI ET AL.	
	Examiner	Art Unit	
	Paul E. Patton	2822	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/13/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muramatsu (US 2002/00220859 A1) in view of Higashi et al., (USPAT 5,918,113) hereinafter Higashi and further in view of Saito (USPAT 7,060,602 B2).
4. As to claims 1 and 3, Muramatsu discloses and shows (Figs 1 & 3) a semiconductor 13b having a photodetecting unit (11) formed on one surface, a thinned portion formed by etching a region, opposing a photodetecting unit, of another surface, and first electrodes disposed on the one surface of an outer edge of the thinned portion and electrically connected to the photodetecting unit; a wiring substrate (21) disposed to oppose the one surface side of the semiconductor substrate and having second electrodes (23) connected via conductive bumps (25) to the first electrodes; and a resin (27), filling a gap between the wiring substrate and the outer edge of the thinned portion

to reinforce the strength of bonding of the respective first electrodes and the respective second electrodes with the conductive bumps.

Fig.1

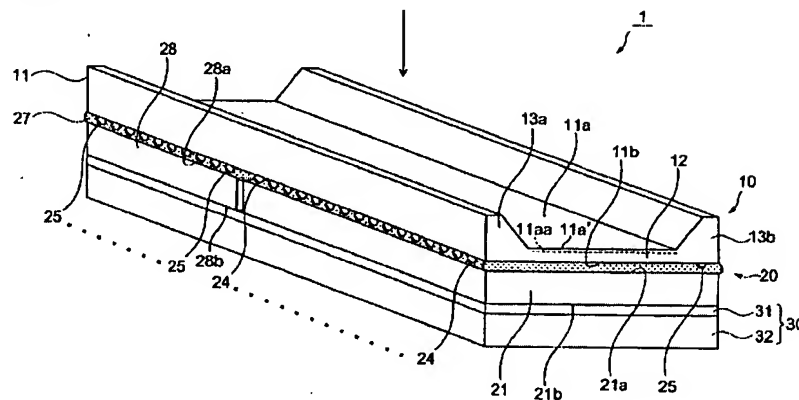
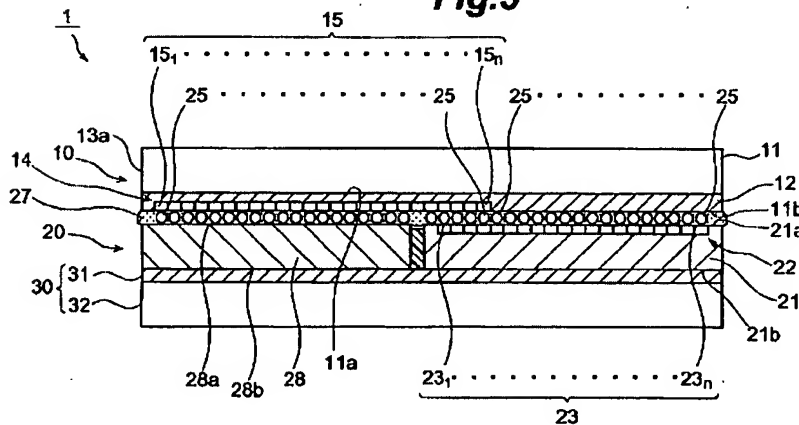


Fig.3

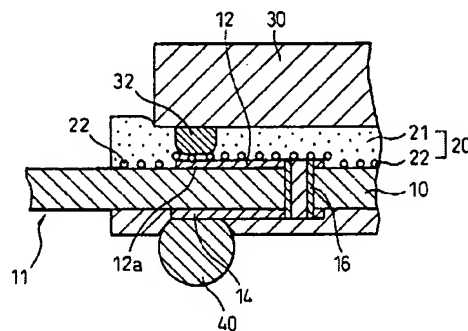


5. Muramatsu does not disclose or show that the resin is a resin sheet that is formed in advance so as to surround a periphery of a gap between the thinned portion and the wiring substrate, adhering the sheet to a predetermined region on the other

surface of the substrate and thermo-compression bonding the semiconductor substrate with the resin sheet to the wiring substrate.

6. Higashi discloses and shows (Higashi, Fig 1) the resin is a resin sheet that is formed in advance so as to surround a periphery of a gap between the thinned portion and the wiring substrate, adhering the sheet to a predetermined region on the other surface of the substrate and thermo-compression bonding the semiconductor substrate with the resin sheet to the wiring substrate. (Column 3, line 37 – column4, line 43, see also the entire patent).

Fig. 1



7. Higashi is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use a resin sheet that is formed in advance so as to surround a periphery of a gap between the thinned portion and the wiring substrate, adhering the sheet to a predetermined region on the other surface of the substrate and thermo-compression bonding the semiconductor substrate with the resin sheet to the wiring substrate.

8. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Muramatsu by using a resin sheet that is formed

in advance so as to surround a periphery of a gap between the thinned portion and the wiring substrate, adhering the sheet to a predetermined region on the other surface of the substrate and thermo-compression bonding the semiconductor substrate with the resin sheet to the wiring substrate for advantages such as simplifying the assembly process with improved production efficiency according to the teachings of Higashi (Column 1, lines 49-53).

9. Muramatsu as modified by Higashi does not disclose that the resin sheet surrounds the periphery of the gap between the wiring substrate and the outer edge of the thinned portion of the device except for portion of the periphery.

10. Saito, discloses and shows (Fig 2) a resin sheet (30) surrounding the periphery of a device except for a portion of the periphery.

11. Saito is evidence that a person of ordinary skill in the art would find a reason, suggestion or motivation to use a resin sheet surrounding the periphery of a device except for a portion of the periphery.

12. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Muramatsu as modified by Higashi by using a resin sheet surrounding the periphery of a device except for a portion of the periphery for advantages such as permitting the ingress or egress of materials filling the gap according to the teachings of Saito. (Column 8, lines 35-53).

As to claim 2, Muramatsu discloses the photodetecting unit has a plurality of pixels (15) that are arrayed one-dimensionally or two-dimensionally.

Application/Control Number:
10/573,467
Art Unit: 2822

Page 6

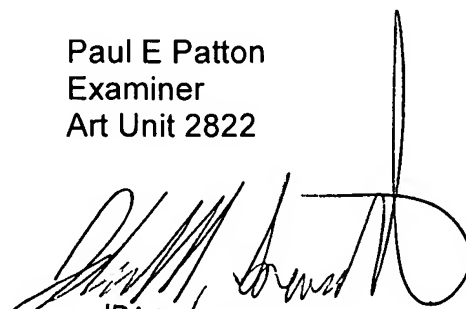
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul E. Patton whose telephone number is 571-272-9762. The examiner can normally be reached on 7:00 - 5:30 Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


PEP

Paul E Patton
Examiner
Art Unit 2822


IDA M. SOWARD
PRIMARY EXAMINER